LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **COMPUTER SCIENCE**

THIRD SEMESTER – **APRIL 2022**

UCS 3503 – DATA STRUCTURES

Date: 23-06-2022   Dept. No. 　　　　　 Max. : 100 Marks
Time: 01:00 PM - 04:00 PM

PART – A	**(10x 2 = 20 Marks)**

Answer ALL the Questions

Q. No
1 List the operations on data structure.
2 Write the formula to identify an element in an array stored in Row major order.
3 Define a Queue.
4 Convert the infix expression (2+3-4+5*6) into postfix.
5 Define a node in linked list.
6 Write the advantages of a Doubly linked list.
7 What is a directed graph? Write example.
8 Define height of a tree.
9 What is linear search?
10 Write the steps to perform insertion sort.

PART – B	**(5 x 8 = 40 Marks)**

Answer ALL the Questions

11 a) Explain Column major order representation of a two-dimensional array.
OR
    b) Discuss about inserting an element in an array.

12 a) Write an algorithm to insert an element in a Queue. Explain with example.
OR
    b) Describe the algorithm to convert infix expression into postfix

13 a) Write an algorithm to insert an element at a particular location in a singly linked list with example.
OR
    b) Explain inserting an element in a doubly lined list as a first and a last element in a doubly linked list with example.

14 a) Explain Post order traversal with example.
OR
    b) Explain Depth First Search algorithm with example.

15 a) Explain binary search algorithm. Find the presence of 23 in the list using binary search algorithm
        2, 5, 8, 12, 14, 16, 19, 23, 38, 48, 56.
OR
    b) Describe the Selection sort algorithm.

PART – C	**(2 x 20 = 40 Marks)**

Answer any TWO Questions

16 a) Describe the multi-dimensional array representation with example.
    b) Explain FIFO structure with example.

17 a) Write an algorithm to
    i)   Search an element in a singly linked list.
    ii) Search an element in a doubly linked list.
    b) Define a binary tree. Explain the storage representation of a binary tree with example.

18 a) Explain Merge Sort algorithm with example.
    b) Write an algorithm to count the number of elements in a Queue. Give example.

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